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ABSTRACT

Uses of discipline and program cost data by Indiana private colleges and universities are discussed, and cost data are presented. Attention is directed to the immediate and longer range uses of the data, the applicability of the methods to smaller institutions, reliability of the data, and the future of this analysis. The findings were used for comparative purposes to provide each institution a historical benchmark for planning and making projections. To determine the cost of producing a credit hour and a program major, an Induced Course Load Matrix (ICLM) was developed. The ICLM also reveals how enrollments in one field affect many departments, providing the average number of credit hours taken by students in various majors. The need to replace faculty members can be assessed using: a productivity ratio (a function of faculty class load and class size), projected student demand data, and the Resource Requirements Prediction Model cost data. The statistical tables cover five areas: direct cost per study credit hour by discipline, full cost per credit hour by discipline, productivity ratio, direct cost per student major by program, and full cost per student major by program. The calculation of each of these five types of data is also outlined. A glossary is included. (SW)

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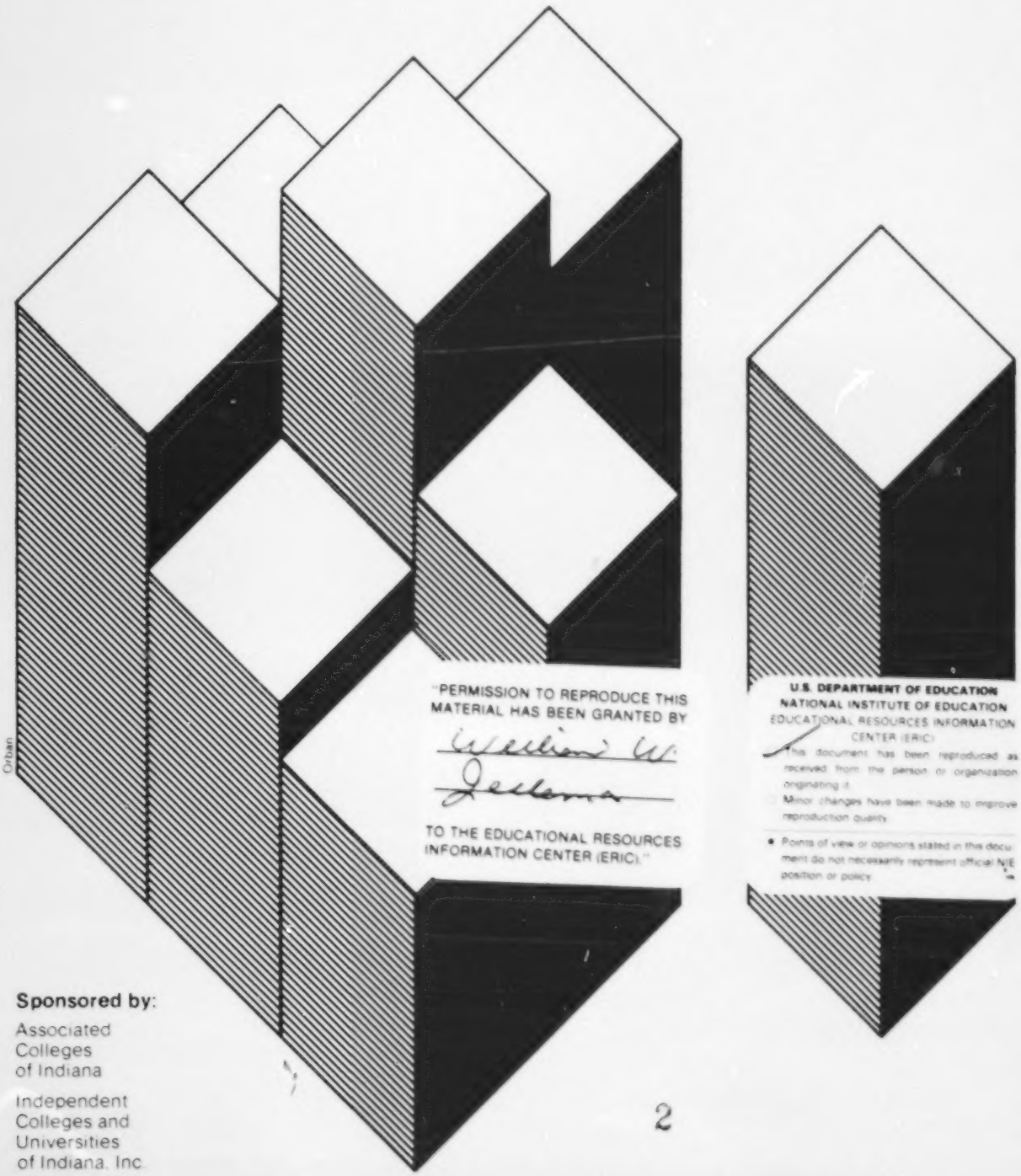
Study of Independent Higher Education in Indiana

Cost of Instruction

William W. Jellema, Director



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COST OF INSTRUCTION

A Report To The
Associated Colleges of Indiana
And The
Independent Colleges and Universities of Indiana, Inc.
By The
Study of Independent Higher Education in Indiana

William W. Jellema, Director
James Olliver, Assistant Director

January, 1975

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FOREWORD

The Study of Independent Higher Education in Indiana was commissioned by the Associated Colleges of Indiana and the Independent Colleges and Universities of Indiana, Inc., whose joint boards acted as a steering committee* to provide overall direction for the Study.

Underwritten by the Lilly Endowment, Inc., the Study's main purposes were to enable both the private sector as a whole and individual institutions to understand themselves better; and as a consequence of that understanding, to present themselves and their case to the public and to their various constituencies articulately; and, further, to establish and develop the expertise of local institutions in systematically collecting data to satisfy their continuing needs for self-understanding and articulation.

In its year of operation the Study produced six reports on studies that were useful to both the sector and the individual institutions. These reports deal with:

Institutional Goals

Cost of Instruction

Student Characteristics and Finances

Financial Health

Interinstitutional Cooperation

Economic Impact

The following report on the cost of instruction is based on data that follows the definitions and conventions of the Information Exchange Procedures (IEP) Project of the National Center for Higher Education Management Systems (NCHEMS) for analyzing institutions and for exchanging data among institutions. The NCHEMS Preliminary Reporting and Exchange Procedures Manual contains the guidelines, definitions, and step-by-step procedure we followed.

An institution--and a sector of higher education--is much more than an accumulation of isolated unit-cost data. We should not imagine, therefore, that these data can stand as proxy for the dynamics of the institutions whose activities created the data. Nor should our emphasis on the institutions' economic efficiency be confused with their educational effectiveness.

Rather, we should use these data to sharpen our focus on the resources needed to operate these schools and to see more clearly what we are buying with our educational expenditures.

The following are the people who labored to produce the data under the firm endorsement and encouragement of their presidents:

Anderson College---------*Robert A. Nicholson, Vice President Academic Affairs*
Ronald Moore, Controller and Assistant Treasurer
Lucille Strawn, Assistant Registrar
Duane Hoak, Dean of the Faculty

Bethel College----------*Wayne Gerber, Academic Dean*
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Wabash College	James A. Warden, Director of Computer Services William L. Henderson, Director of Development Victor M. Powell, Dean of the College Donald L. Sperry, Comptroller

Twenty-five of the thirty-two independent four-year accredited institutions in the State of Indiana succeeded in producing full cost data. Four additional institutions were able to develop direct cost data. The remaining institutions, for a variety of reasons, did not complete the program in time to be included in this report. However, all at least built an Induced Course Load Matrix (ICLM). The thirty-two institutions are listed in the table below.

Institution	Built ICLM	Developed Direct Cost Data	Developed Full Cost Data
Anderson College	X	X	X
Bethel College	X	X	X
Butler University	X		
Calumet College	X	X	
Concordia Senior College	X	X	X
DePauw University	X	X	X
Earlham College	X	X	X
Fort Wayne Bible College	X	X	X
Franklin College	X	X	X
Goshen College	X	X	X
Grace College	X		
Hanover College	X	X	
Huntington College	X	X	X
Indiana Central College	X	X	X
Indiana Institute of Technology	X	X	X
Manchester College	X	X	X
Marian College	X	X	X
Marion College	X	X	X
Northwood Institute	X	X	X
Oakland City College	X	X	X
Rose-Hulman Institute of Technology	X	X	X
Saint Francis College	X	X	

Institution	Built ICLM	Developed Direct Cost Data	Developed Full Cost Data
Saint Joseph's College	X	X	X
Saint Mary-of-the-Woods College	X	X	X
Saint Mary's College	X	X	
Saint Meinrad College	X	X	X
Taylor University	X	X	X
Tri-State College	X		
University of Evansville	X	X	X
University of Notre Dame	X	X	X
Valparaiso University	X	X	X
Wabash College	X	X	X

Also contributing substantially to the successful completion of this study were, in the data processing center at the University of Notre Dame: Leo Corbaci, Leo Judy, and Eric Freitag. In the center at the University of Evansville: Manfred Schauss and Richard Brashears. From NCHEMS, David Clark. From St. Joseph's College, William G. Verbrugge.

And in the Study office, James Olliver, Assistant Director, and in turn, Elizabeth Shelby, Harriet O'Connor, and Beverly Patterson.

William W. Jellema
Director

January, 1975

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* Members of the Steering Committee:

Reverend Charles Banet, President, St. Joseph's College
Dr. Richard M. Bateman, President, Tri-State College
Reverend James T. Burtchaell, C.S.C., Provost, University of Notre Dame
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COST OF INSTRUCTION

IMMEDIATE USES OF THE DATA

We analyzed the cost of instruction in the independent sector (reported herein) for several specific reasons, some short-range, some longer-range.

Of immediate interest to each of the participating institutions were our findings on the actual cost of producing a credit hour, discipline by discipline, and the actual cost of producing a program major, program field by program field. Twenty-nine of our thirty-two institutions produced, in less than nine months, direct cost figures (faculty compensation, departmental support staff, equipment, and the like), and twenty-five produced full cost figures (direct costs plus library, central administration, plant maintenance, and so on) for all of their disciplines and for each of their programs.

For the first time, most of these institutions possessed concrete data on the cost of instruction with which to verify or challenge their general impressions of costs and to sharpen their awareness of the degrees of difference among disciplines and program areas. If we judge by the experience of other institutions, their immediate potential uses for this kind of information are many and varied.

Some institutions, like the State University of New York at Plattsburgh*, have used these data to decentralize the administrative process, pushing internal decisions for allocation down to the departmental level. Others, such as the University of Northern Colorado, have used the data to focus their internal planning on outputs rather than inputs, on degree programs rather than disciplines and departments. Still others, like Rider College, have used the data and the programs in the collective bargaining process to formulate contract proposals and respond to union proposals regarding faculty workload, salaries, and fringe benefits. The college finds that it now possesses the capacity to

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* This illustration, like others in the paragraphs that follow, was drawn from Robert A. Huff and Michael E. Young's "Profiles of Management Information Uses", National Center for Higher Education Management Systems at Western Interstate Commission for Higher Education, Boulder, Colorado, May, 1974.

see relationships between the variables quickly. The presence of these convincing data at Indiana's own St. Joseph's College led to a departmental proposal that physics be continued only as a minor, not as a major, field of study.

In order to discover program area costs it is first necessary to build an Induced Course Load Matrix (ICLM). This program shows the contribution made by each discipline or department to each degree major. (A student majoring in chemistry, for example, also takes work in mathematics, biology, and the social sciences.)

The ICLM, some institutions have discovered, is a useful instrument in and of itself quite apart from its subsidiary use in procuring program cost data. Not only has it offered faculty members an improved understanding of the interrelationships among departments, revealing how enrollments in one field affect many departments, and providing the institution, usually for the first time, the average number of credit hours taken by students in various majors, but it can, as at Mansfield State College, provide intelligence useful for recruiting students. The ICLM can indicate the areas where enrollment can be increased for only marginal costs. This permits the admissions office to direct its attention more specifically to students holding high interest in those program areas.

The productivity ratio (a function of faculty class load and class size), a product of the ICLM, when combined with the projected student demand data also produced by the ICLM and with the Resource Requirements Prediction Model (RRPM) cost data, enables an institution to consider replacing its faculty members on the basis of a need analysis rather than on established patterns of departmental strength. When the programs indicate that the productivity ratios will be maintained at an acceptable level if a faculty position is left vacant, then, when faculty members leave a position, the options of new appointments in that department or elsewhere become broader. The need created by heavy student demand in some fields or the need created by the "critical mass" necessary to maintain academic strength in these or other fields can be weighed against the political need created by existing departmental manpower patterns.

These, then, are some of the immediate, specific, and concrete uses of the data provided to Indiana's private institutions as a result of their work in producing discipline and program cost data. With the single

exception of St. Joseph's College, however, no institution in the state has possessed these data long enough to report employing them in any of these ways.

LONGER-RANGE AND BROADER USES OF THE DATA

As the word prediction--the P in RRPM--indicates, the Resource Requirements Prediction Model has a simulation phase which, when enhanced by subsequent years of data, can enable an institution to project future requirements. As institutions contemplate new or existing departments or programs, they can predict the resources they will need. The model allows one to modify certain variables to see what changes in requirements these modifications would necessitate. Again, the data are too new for these Indiana institutions to have had an opportunity to utilize the simulation phase of the model.

Most of the institutions that have produced these data have also prepared a summary document which, in terms of specificity, goes well beyond the general figures we can report here. Each institution has prepared tables showing its own specific costs per credit hour, its costs per student major, and its productivity ratios. They have, again almost without exception, shared these reports with the other independent institutions.

These comparative data, identified by institution, give these colleges and universities the longer-range opportunity to sit together and compare costs. The demonstration that there are differences in costs among institutions is less helpful than the opportunity now given the institution to ask (and get answers to) the question, "Why are our costs different from yours?" An individual institution gets figures that show its program in music, for example, is more costly than history. When two institutions well known to one another sit together, however, they can compare music to music and history to history, and ask the question "Why?" at a deeper level of inquiry than when asking the question of their own data in isolation from the data of other specific institutions.

Not all of the uses of these data, by any means, are confined to the internal processes of each individual institution. Some have a much broader impact.

It is no secret, for example, that much of the impetus for producing these data is coming (or is likely soon to come) from sources outside the institution. The National

Commission on Financing Postsecondary Education has recommended national standards for colleges to follow in calculating their costs per student. That recommendation likely will soon be followed by requests for voluntary compliance, as these, in turn, give way to stronger requests of institutions seeking financial support from the federal government. Nor is the situation different at the state level. Here, too, public and private institutions seeking state support are likely to be asked in increasingly stronger terms for just such data as these Indiana institutions have produced.

By taking the lead in the State of Indiana (and in the nation), Indiana's independent sector has prepared itself to affect the direction and emphasis of new standards. It now has a detailed understanding of the implications associated with the use of costing procedures. In the normal course of events its experience would have been the reverse--that of following instead of leading other institutions. The experience and expertise would have been developed by others and the procedures and standards would have been firmly set long before the smaller private institutions had opportunity to understand them or their significance.

The state's interest in these data may lead to its considering changes in its patterns of funding. The University of New Mexico's Board of Regents passed a resolution urging that the State establish a funding system based on differential costs by level and by program. This system could, conceivably, be applied to private institutions according to a formula that offered aid to the private sector by relating its instructional costs to those in the public sector.

We are not proposing that this be done. Nevertheless, private institutions have nothing to fear, collectively, in the comparison. When these cost data become available in the public as well as in the private sector, they should be able to refute the charge that private higher education is outrageously expensive compared to costs at other institutions in the state. These data will enable private institutions to put into perspective the fact that while private higher education extracts a high charge from its consumers, its cost of operation is not, per se, expensive or inefficient.

Quite apart from what the state may do, the private institution may wish to consider following the recommendation of the Carnegie Commission on Higher Education which

advised that private colleges and universities carefully study their educational costs per student and consider restructuring their tuition charges, so that tuition is relatively low for lower division students, higher for upper division students, and higher yet for graduate and professional students. Private institutions might also want to consider other variations, such as charging tuition on the basis of the costs of major fields or on the basis of these costs and the financial resources of students. The point is, with these kinds of data and the ability to produce them, these institutions have the opportunity to examine some of the implications of these alternate ways of structuring tuition charges. This is a longer-range use of these data.

By demonstrating the ability to produce these data the independent institutions provide concrete evidence that their claims to efficiency in the management of scarce resources have a substantial foundation. Simply doing this analysis in the brief time allotted for it demonstrates an impressive sophistication about costs and management. Being able to produce these data enables these colleges to be more rational in their decision-making. Every institution must make decisions that are at least in part based upon financial considerations. What must be financial assumptions at most institutions can become financial evidence at independent Indiana institutions.

APPLICABILITY TO SMALLER INSTITUTIONS

The Resource Requirements Prediction Model was designed primarily as a planning instrument, enabling institutions to forecast resource requirements. With its ability to simulate, it is a large program. It has also been used as an analytical instrument to generate historical discipline unit costs and costs per student within various fields of study. It was so used in this study. The data derived from the study, used here for comparative purposes, provide each institution a historical benchmark for planning and making projections. In the future, however, the Information Exchange Program (IEP) of the National Center for Higher Education Management Systems (NCHEMS) will offer a shortcut to the production of those data that will not include the simulation option. This will make using the program easier, although an institution will still need access to a medium size computer.

Nevertheless, even in its present form, the program was not larger than the ability of smaller institutions to cope with it; and larger and more complex institutions, usually blessed with greater technical competence, were also able to handle the program. It is possible to inflate or to deflate some parts of the program to accommodate the specific requirements and data availability of the individual institutions. All tools in the program have been used by both very large and very small institutions.

The cost of the program is a material factor in its applicability to smaller institutions. Only a few years ago figures like $50,000 to $100,000 were offered as best "guesstimates" of what it would cost to implement such analytical tools as RRPM in any given institution. We estimate that we have been able to implement the program in these several institutions for about $1,000 per institution. This figure ignores imputed manpower costs within the institution, thus underscoring both the fact that the program cannot be implemented without the dedicated willingness of people already in place in the institution and the fact that willing people working with an overload can implement the program without importing substantial amounts of additional talent. We estimate that with the expertness now present on each campus, perhaps seventy percent of the work necessary to carry out this program over a five-year period has already been expended, the remaining thirty percent being spread over the next four years. The annual out-of-pocket cost to each small institution ought to be about five hundred dollars.

We were also concerned about applying an enrollment-driven model to institutions in a stable or decremental state of enrollment. A model aimed at projecting resource requirements seemed somewhat more suited in its simulation phase to an incremental enrollment situation than a decremental one--and this seems to be the case. We will know better when the institutions have used the model for simulation. Even so, however, the model offers a decremental institution the opportunity to examine alternatives by changing its productivity ratios. If, in a decremental situation, the productivity ratios are not changed then, other variables staying the same while enrollment drops, the model will simply tell you that you need fewer faculty.

There are, moreover, changes in programs, shifts in the attention of students, and changes in the numbers of students at various levels, which can be hypothesized. The model can accommodate these shifts and reveal what some of the implications will be for various departments even in a decremental situation.

RELIABILITY OF THE DATA

Our first year through the program has left some rough spots which subsequent years of experience will smooth. Not all institutions accomplished the cross-over from the institution's chart of accounts to the Program Classification Structure (PCS) of the program with the same degree of accuracy and attention for detail. This affects the degree to which the data reflect genuine differences in cost among institutions. Our best estimate at this time is that the data are eighty percent comparable. This means that whenever the figures from one institution vary less than twenty percent from the figures of another institution, they ought not to be seized upon as necessarily reflecting any real difference between the cost efficiency of the two institutions. Subsequent years of cost studies may reduce that variance to ten percent.

The figures differ from one institution to another for a variety of reasons other than accuracy, some of which may be only temporary. A department with faculty members on sabbatical would, if compared with a department without members on sabbatical, suffer by the comparison that year. The same is true of expensive equipment purchases if these are not amortized. More than one year of data will be needed to smooth out these differences.

Some differences, however, will remain. These will raise the question of quality which will, in turn, emphasize the need for better outcome indicators than we presently possess. Meantime, the cost differences will encourage institutions to develop descriptive differences of their academic programs to account for the cost differences. These cost differences will also encourage institutions to compare their figures with like institutions, because not every institution attempts to do the same things with and for its students. Institutions must now say so and seek comparisons with institutions like themselves.

The figures deal with average cost. They are, therefore, somewhat less useful to institutions in their planning than marginal costs would be. This is not a reflection on the reliability of the data, but only a comment on their limitations.

Even so, like the crack about money--it may not be everything but it is way ahead of whatever is in second place--so with these figures. They are not the final word in measuring cost efficiencies, but they are a giant stride ahead of the methods and data we previously possessed to compare instructional costs among institutions.

THE FUTURE OF THIS ANALYSIS

Each institution must now weigh the benefits to them and to higher education in the State of Indiana in continuing to derive these data. Their usefulness will be greatly augmented when comparable figures are produced in the public sector and when more than one year of data becomes available.

Each private institution is now in a position to answer the question of benefits from a vastly different vantage point than it possessed one year ago. One of the broader benefits of this study deals not with the data but with the process. Institutions that have been through the process now possess a stronger sense of confidence in their understanding of these data and their uses than they would have had without that participation.

Therefore, if there are any institutions that now say: "We have done the program, we have examined the results, and we do not think it is worth the effort to continue," this could be a healthy outcome of the whole enterprise. There is a big difference between deciding that you do not want to go to the dance after you have been asked, and pretending that you did not want to go anyway even though no one asked you. Part of what we have done is to give each of these institutions an invitation to the prom. They now have the self-confidence to accept or decline on the invitation's own merits.

Not everyone responds with the same degree of enthusiasm to more information. One needs no information at all to make decisions, especially the most popular one--inaction. Even relevant information can be disquieting. It robs the decision-maker of the defense of ignorance without replacing that defense with definitive interpretations.

These kinds of data have often been grandiously billed as the great black and white hope in the increasingly difficult heavyweight struggle to understand, guide, and effectively manage institutions of higher learning. Those who claim, "These data are the answer" should expect the response, "What was the question?" Before employing these data in the solution of problems, the problems themselves must be understood. Those who do not know the question will not find the answers here. Data, unlike endocrine glands, do not secrete their own significance.

It does not appear that many Indiana private institutions will elect to discontinue this analysis. Most

have already begun to work out arrangements with the computer processing centers for independent contracts to continue the study. Their determination will be reinforced, of course, if NCHEMS or some other body offers further leadership.

THE TABLES

The tables that follow constitute the heart of this report. Since, to the best of our knowledge, comparable figures do not exist for other large numbers of institutions, we will not attempt to comment on the significance of these figures vis-a-vis instructional costs in other states. The interested reader will want to examine on his own the differences from one discipline to another or from one program major to another, as well as the ranges of those costs among these several institutions.

The five categories of data displayed in the tables, and the method of obtaining them, are as follows:

A. Direct Cost Per Credit Hour by Discipline*: calculated by dividing the direct cost of each discipline by the total number of credit hours produced by the faculty members teaching in that discipline.

B. Full Cost Per Credit Hour by Discipline: calculated by dividing the full cost of each discipline by the total number of credit hours produced by the faculty members teaching in that discipline.

C. Productivity Ratio: a function of faculty course load and class size, it is calculated by dividing the credit hours produced in an academic discipline by the number of full time equivalent (F.T.E.) faculty in that discipline.

D. Direct Cost Per Student Major by Program: calculated by dividing the direct cost of each program by the number of F.T.E. student majors in that program.

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* A glossary of frequently used terms is provided as an appendix to this report.

E. Full Cost Per Student Major by Program: calculated by dividing the full cost of each program by the number of F.T.E. student majors in the program.

The direct and full cost by discipline (tables A and B) represent the range of institutional costs for one semester credit hour in each given discipline. Tables C and D exhibit the cost to the institution of producing the hours required by each student major for the academic year. Mirroring the diversity within Indiana's private sector there is, in most instances, a wide range between the "high" and the "low" cost. This results from a number of factors including faculty compensation levels, differences in support staffing patterns, equipment purchases, class size, and so on.

A high cost is not necessarily "bad" any more than a "low" cost is good; but the pattern of cost figures provides a common denominator for comparing relative resource consumption. Not all disciplines or programs have equivalent costs. The data from the Indiana independent institutions reveal generally higher costs in the physical sciences and languages than in the social sciences. For example, the median direct semester credit hour cost in physics is $52; in classics, $45; and in German, $56; while the median cost in history is $27; in sociology, $23; and in psychology, $24. This is not surprising given higher costs for laboratory and other equipment in the physical sciences coupled with a possible reduction in credit hours produced due to a high contact hour load by both faculty and students. Low enrollments in foreign languages contribute to the higher costs in that area. Music, with the highest median direct discipline cost at $65, requires expensive equipment, a high contact-to-credit-hour ratio, and a great deal of individualized instruction. Second highest in cost is nursing which is high for many of the same reasons.

Median costs are not the only ones of interest. They are probably the most secure in their accuracy and therefore invite comparisons most readily. Figures at the extremities--the lows and the highs--deserve particular inquiry into the specific situations at the institutions in which they occur.

The quartile figures add a further dimension. Typically, the higher the median figure, the greater the spread between the quartiles. Thus, music with a median figure of $65, has a spread of $31 between the first and third quartiles. But physical education and health also

has a spread of $31 with a median of only $30; and physics at $52 has the highest spread of $39. These may offer institutions some of the more promising first avenues of inquiry concerning the legitimacy of their own costs in these areas.

The institutions themselves must answer the questions, "How much more should X discipline cost?" and "Is the amount now being spent too little or too much?" Most importantly, they must ask themselves, "Are we fulfilling our institutional goals in the most efficient and effective manner?" Only those familiar with an institution's goals and priorities can finally evaluate these cost figures. The independent colleges and universities in Indiana are able, on the basis of these figures and the comparison they invite among disciplines within the institution and between institutions, to pass judgment on these figures as representing the most appropriate use of their available resources.

The figures in the tables that follow were all made to conform to thirty semester credit hours as the definition of a full-time equivalent student for one year. However, not all institutions are on the semester system. Some are on the quarter system, some on a course system. Some of those that are on the semester system, moreover, do not themselves define a full-time student as one taking thirty hours. Our requiring a common exchange of thirty semester hours, therefore, forces some inequities into the data.

This caveat aside, one is struck by the differences between the highs and the lows in the productivity ratios Productivity ratios provide a measure of the hours produced by the faculty in the various disciplines. They are, thus, an expression of student-teacher ratios in various disciplines. Since an F.T.E. student is by definition 30 semester credit hours generated throughout the academic year, such student-teacher ratios can be comparatively calculated. Thus the median student-teacher ratio in music is 7.6 to 1; in classics 11.9 to 1; in physics 10.1 to 1; in German 10.2 to 1; in sociology 20.3 to 1; in history 19.0 to 1; and so on.

We got our figures from summary reports prepared by each institution or directly from that institution's RRPM printout, where summary reports were not available. No discipline or program found in fewer than five institutions is entered in these comparative tables. None with fewer than eleven has the quartile figures included.

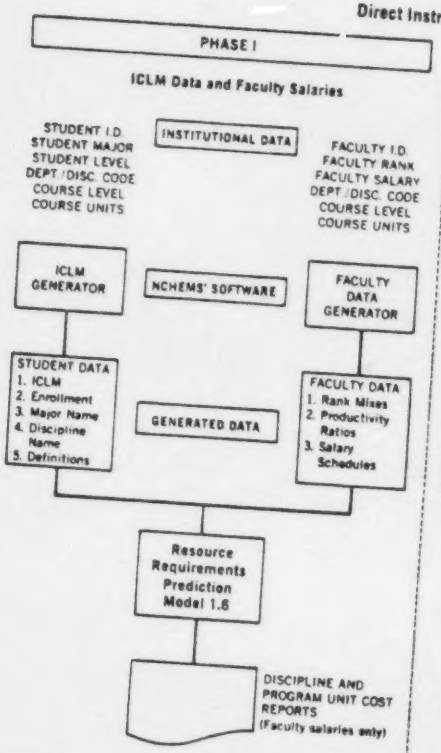
A chart appears at the head of these tables. Although cast in somewhat technical form, it presents the interested reader a very succinct outline of the general flow of the data used to generate the tables that follow, and identifies the data elements needed at each stage in the procedure.

PRELIMINARY IEP FIELD TEST PROCEDURES

Direct Instructional Costs

PHASE I

ICLM Data and Faculty Salaries

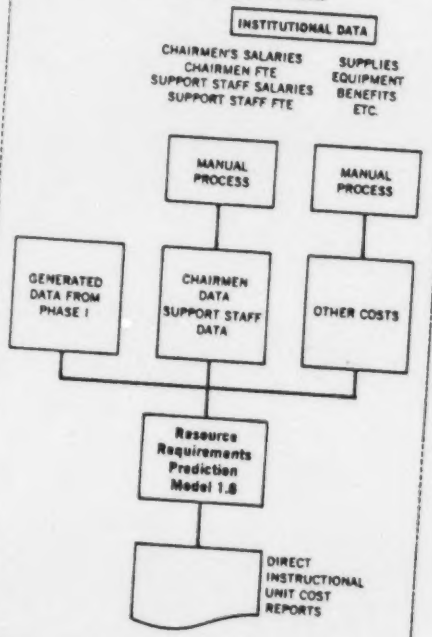


COMMENTS:

1. In this phase faculty salaries may or may not include faculty benefits.
2. Generally, according to the Information Exchange Procedures, ICLM and faculty data represent the regular sessions of the academic year.
3. The data resulting from the ICLM Generator and the Faculty Data Generator will be combined with other data described in Phase II and Phase III.
4. For each course taken by each student or taught by each faculty member a record must be created containing the data elements mentioned above.

PHASE II

Chairmen's Salaries, Support Staff Salaries, and Other Discipline Costs



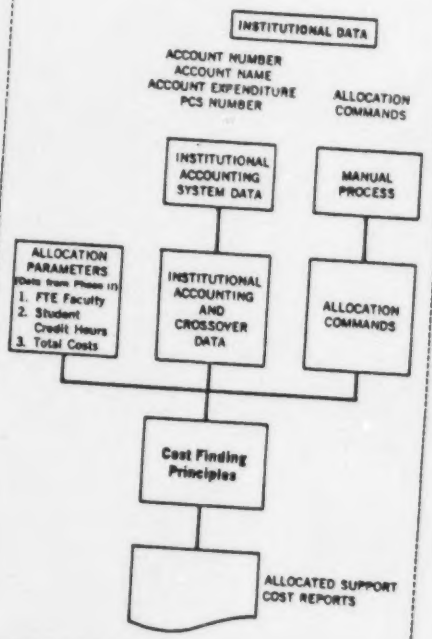
COMMENTS:

1. The chairmen's full-time equivalencies and salaries are distributed to the disciplines they support. The distribution of these data is on the basis of discipline faculty salary dollars. The percentage distribution of salary dollars across disciplines can be obtained from Phase I RRPM 1.6 reports. The same procedure is used for the distribution of support staff and their salaries to disciplines.
2. The other discipline costs are distributed to each discipline, primarily on the basis of discipline faculty salary dollars. Where actual usage data are available the other costs are distributed on that basis.
3. If faculty and staff benefits are not part of Phase I, they can be distributed to each discipline on the basis of discipline salary dollars.
4. Generally, other costs represent the regular session of the academic year.

Full Costs

PHASE III

Allocation of Indirect Costs

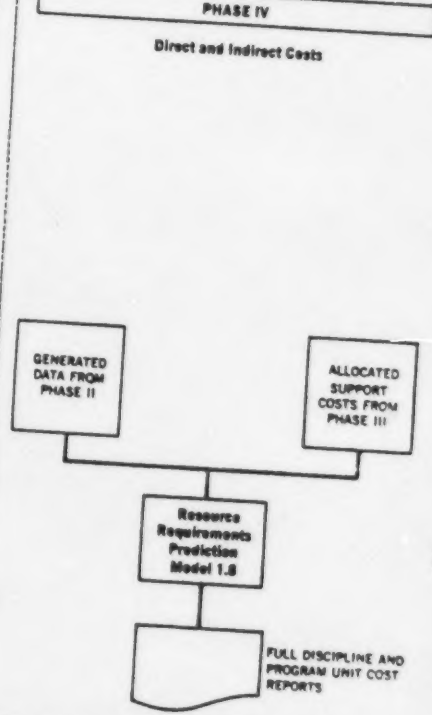


COMMENTS:

1. The institutional accounting data is crossed over to NCHEMS' Program Classification Structure (PCS). This standardized structure is used for exchanging data.
2. The allocation of indirect costs (i.e., libraries, physical plant, etc.) is on the basis of procedures defined by IEP.

PHASE IV

Direct and Indirect Costs


GENERATED DATA FROM PHASE II
ALLOCATED SUPPORT COSTS FROM PHASE III
Resource Requirements Prediction Model 1.8
FULL DISCIPLINE AND PROGRAM UNIT COST REPORTS

COMMENTS:

1. Full costs do not include intercollegiate athletics, faculty and staff services, or independent operation. These are final cost objectives which correspond to PCS activity categories 5.1.7200, 5.5, 6.6 and 7.0, respectively.

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STUDY OF INDEPENDENT HIGHER EDUCATION IN INDIANA
Cost of Instruction Sub-Study
A. DIRECT COST PER UNDERGRADUATE CREDIT HOUR BY DISCIPLINE

	Low	1st Quartile	Median	3rd Quartile	High
Accounting (5)*	$12	$	$23	$	$31
Art (19)	22	29	36	44	60
Biology[1] (21)	18	27	34	39	58
Business/Business Administration (11)	11	17	20	23	42
Chemistry (21)	22	40	43	57	88
Classics[2] (7)	25		45		145
Computer Science (6)	15		35		59
Economics (15)	8	20	28	40	57
Education[3] (23)	19	27	34	42	130
English[4] (23)	15	21	30	37	62
Fine Arts (6)	11		21		63
Geography/ Geology (9)	10		30		49
German (5)	37		56		98
History (20)	13	19	27	37	50
Home Economics (6)	25		33		49
Humanities[5] (6)	12		23		51
Interdisciplinary[6] (13)	8	14	21	23	36
Languages[7] (21)	21	33	42	56	85

STUDY OF INDEPENDENT HIGHER EDUCATION IN INDIANA
Cost of Instruction Sub-Study
A. DIRECT COST PER UNDERGRADUATE CREDIT HOUR BY DISCIPLINE

	Low	1st Quartile	Median	3rd Quartile	High
Mathematics[8] (24)	$18	$27	$33	$38	$77
Music (21)	33	50	65	86	123
Nursing (5)	43		63		109
Philosophy (12)	11	18	27	36	47
Physical Education/ Health[3,9] (20)	18	25	30	56	90
Physical Science (6)	16		18		56
Physics (20)	28	41	52	80	241
Political Science/ Government (13)	23	25	34	41	68
Psychology[3] (19)	11	16	24	30	38
Sociology[10] (21)	9	17	23	28	35
Speech and Theatre Arts[11] (18)	21	33	48	65	102
Theology/Religious Studies[12] (22)	9	16	23	31	71

* The figure in parentheses indicates the number of institutions represented.

[1] Also Biology/Science and in the case of one institution a single weighted figure for Zoology and Botany.

[2] Includes Classical Languages and in the case of two institutions a single weighted figure for the combined disciplines of Greek and Latin.

[3] Includes one college which has combined Education, Physical Education and Psychology.

STUDY OF INDEPENDENT HIGHER EDUCATION IN INDIANA
Cost of Instruction Sub-Study
A. DIRECT COST PER UNDERGRADUATE CREDIT HOUR BY DISCIPLINE

[4] Includes one college which has combined English, Human Communication, and Foreign Language.

[5] Includes one institution which has combined humanities and social sciences.

[6] Includes Integrated Studies, General-Liberal Education, and Collegiate College Studies.

[7] Includes "Modern Languages", "Romance Languages" and four institutions with a single weighted figure for the combined disciplines of French and Spanish.

[8] Includes two institutions with disciplines entitled "Math and Physics" and "Math and Science"

[9] The recorded cost at one institution has been deleted from this analysis since noncredit courses caused the cost to be unrealistically high. Inclusion of this figure as the "high" would have distorted rather than illuminated the true range of costs.

[10] Includes joint disciplines of Sociology/Anthropology and Social Work/Social Services in addition to three institutions with a single weighted figure for two aggregated disciplines in this area.

[11] Includes disciplines listed individually as Speech, Theatre Arts, and/or Drama in addition to two institutions showing a single weighted figure for the aggregated disciplines of Speech and Drama.

[12] Includes the disciplines of Philosophy/Religion and Bible.

STUDY OF INDEPENDENT HIGHER EDUCATION IN INDIANA
Cost of Instruction Sub-Study
B. DIRECT COST PER STUDENT MAJOR BY PROGRAM

	Low	1st Quartile	Median	3rd Quartile	High
Accounting (9)*	$515	$	$666	$	$847
Art (18)	620	778	960	1206	1562
Biology[1] (22)	763	833	987	1285	1809
Business/Business Administration[2] (14)	539	614	662	828	1077
Business Education (6)	599		691		726
Chemistry (22)	484	999	1250	1485	2338
Economics (18)	634	723	870	1159	1573
Education (10)	635		944		1250
Elementary Education (12)	668	784	853	978	1175
Engineering, Electrical (5)	825		1300		1633
Engineering, Mechanical (5)	914		1159		2213
English (22)	696	808	945	1201	1781
French (11)	721	1027	1149	1508	1943
Geology/ Geography (6)	940		1418		1657
German (8)	977		1323		1555
History (22)	604	809	925	1056	1727
Home Economics (6)	689		946		1227

STUDY OF INDEPENDENT HIGHER EDUCATION IN INDIANA
Cost of Instruction Sub-Study
B. DIRECT COST PER STUDENT MAJOR BY PROGRAM

	Low	1st Quartile	Median	3rd Quartile	High
Interdisciplinary(7)	$577	$	$902	$	$1183
Languages (6)	928		1192		2734
Mathematics (22)	711	943	1035	1211	1880
Medical Technology (7)	734		926		1054
Music (20)	931	1138	1498	1876	2653
Nursing (8)	510		1091		1979
Philosophy (13)	625	772	1149	1403	1988
Physical Education[3] (16)	551	652	813	1027	1771
Physics (16)	962	1113	1467	1807	3151
Political Science (15)	623	793	929	1129	1521
Psychology (22)	512	691	813	1014	1568
Social Science (5)	577		835		1093
Sociology (17)	516	632	816	997	1291
Spanish (8)	966		1136		1407
Speech/Theatre Arts[4] (17)	795	916	1104	1546	2359
Theology/Religious Studies[5] (20)	540	703	865	1080	1690
Undeclared (23)	284	657	796	1095	1698

* The figure in parentheses indicates the number of institutions represented.

STUDY OF INDEPENDENT HIGHER EDUCATION IN INDIANA
Cost of Instruction Sub-Study
B. DIRECT COST PER STUDENT MAJOR BY PROGRAM

[1] Includes one institution with one figure for a weighted total of Biology, Zoology and Botany and another instiuttion with one figure for a weighted total of just Zoology and Botany and Bacteriology.

[2] Includes one institution recording freshman and sophomore years only.

[3] Includes one institution with a single weighted total for combined men's and women's physical education. The recorded cost at one institution has been deleted from this analysis since noncredit courses caused the cost to be unrealistically Inclusion of this figure as the "high" would have distorted rather than illuminated the true range of costs.

[4] Includes programs listed separately as Speech or Drama or Theatre in addition to two institutions showing one figure for the weighted total of two of these programs.

[5] Includes programs entitled Bible or Philosophy/Religion in addition to two institutions showing one figure for the weighted total of two of these programs.

STUDY OF INDEPENDENT HIGHER EDUCATION IN INDIANA
Cost of Instruction Sub-Study
C. PRODUCTIVITY RATIO BY DISCIPLINE

	Low	1st Quartile	Median	3rd Quartile	High
Accounting (5)*	375		648		894
Art (19)	203	314	434	513	594
Biology[1] (21)	300	420	531	753	1606
Business/Business Administration (11)	322	434	693	824	901
Chemistry (21)	164	309	375	465	1243
Classics[2] (7)	86		356		665
Computer Science (6)	181		471		635
Economics (15)	277	395	513	660	1618
Education[3] (23)	100	399	437	558	658
English[4] (23)	204	406	505	579	700
Fine Arts (6)	181		713		871
Geography/ Geology (9)	391		538		988
German (5)	127		305		325
History (20)	227	465	569	719	960
Home Economics (6)	219		330		439
Humanities[5] (6)	283		542		1133
Interdisciplinary[6] (13)	383	520	638	904	2156
Languages[7] (21)	127	205	285	405	734

STUDY OF INDEPENDENT HIGHER EDUCATION IN INDIANA
Cost of Instruction Sub-Study
C. PRODUCTIVITY RATIO BY DISCIPLINE

	Low	1st Quartile	Median	3rd Quartile	High
Mathematics[8] (24)	174	370	463	595	842
Music (21)	89	172	229	275	946
Nursing (5)	153		230		297
Philosophy (12)	340	444	495	778	1208
Physical Education/ Health[3,9] (20)	127	301	416	569	947
Physical Science (6)	215		464		1117
Physics (20)	52	206	304	499	624
Political Science/ Government (13)	162	355	473	570	688
Psychology[3] (19)	349	448	693	905	1139
Sociology[10] (21)	315	475	609	811	1197
Speech and Theatre Arts[11] (18)	119	268	365	477	688
Theology/Religious Studies[12] (22)	242	469	595	707	1499

* The figure in parentheses indicates the number of institutions represented.

[1] Also Biology/Science and in the case of one institution a single weighted figure for Zoology and Botany.

[2] Includes Classical Languages and in the case of two institutions a single weighted figure for the combined disciplines of Greek and Latin.

STUDY OF INDEPENDENT HIGHER EDUCATION IN INDIANA
Cost of Instruction Sub-Study
C. PRODUCTIVITY RATIO BY DISCIPLINE

[3] Includes one college which has combined Education, Physical Education and Psychology.

[4] Includes one college which has combined English, Human Communication, and Foreign Language.

[5] Includes one institution which has combined humanities and social sciences.

[6] Includes Integrated Studies, General-Liberal Education, and Collegiate College Studies.

[7] Includes "Modern Languages", "Romance Languages" and four institutions with a single weighted figure for the combined disciplines of French and Spanish.

[8] Includes two institutions with disciplines entitled "Math and Physics" and "Math and Science".

[9] The recorded productivity ratio at one institution has been deleted from this analysis since noncredit courses caused the ratio to be unrealistically low. Inclusion of this figure would have distorted rather than illuminated the true range of productivity ratios.

[10] Includes joint disciplines of Sociology/Anthropology and Social Work/Social Services in addition to three institutions with a single weighted figure for two aggregated disciplines in this area.

[11] Includes disciplines listed individually as Speech, Theatre Arts, and/or Drama in addition to two institutions showing a single weighted figure for the aggregated disciplines of Speech and Drama.

[12] Includes the disciplines of Philosophy/Religion and Bible.

STUDY OF INDEPENDENT HIGHER EDUCATION IN INDIANA
Cost of Instruction Sub-Study
D. FULL COST PER UNDERGRADUATE CREDIT HOUR BY DISCIPLINE

	Low	1st Quartile	Median	3rd Quartile	High
Art (18)*	$40	$58	$74	$91	$146
Biology[1] (19)	39	53	66	71	103
Business/Business Administration (10)	35		41		62
Chemistry (19)	50	69	89	113	169
Classics[2] (5)	48		99		275
Computer Science (5)	42		59		116
Economics (13)	39	46	51	82	141
Education[3] (21)	40	58	71	83	309
English[4] (21)	36	48	59	85	128
Geography/ Geology (8)	26		60		96
History (18)	28	39	57	77	105
Home Economics (6)	44		70		100
Humanities[5] (6)	28		59		89
Interdisciplinary[6] (12)	24	31	44	55	95
Languages[7] (19)	44	60	88	108	174
Mathematics[8] (22)	37	58	64	80	139
Music (20)	57	91	119	160	242
Nursing (5)	102		117		188
Philosophy (10)	34		52		119

STUDY OF INDEPENDENT HIGHER EDUCATION IN INDIANA
Cost of Instruction Sub-Study
D. FULL COST PER UNDERGRADUATE CREDIT HOUR BY DISCIPLINE

	Low	1st Quartile	Median	3rd Quartile	High
Physical Education/ Health[3,9] (19)	$46	$48	$62	$109	$287
Physical Science (6)	31		41		111
Physics (19)	63	81	102	163	413
Political Science/ Government (11)	39	51	62	81	126
Psychology[3] (17)	27	34	52	61	83
Sociology[10] (19)	19	38	52	62	94
Speech and Theatre Arts[11](16)	47	68	93	125	207
Theology/Religious Studies[12] (20)	24	35	43	73	140

* The figure in parentheses indicates the number of institutions represented.

[1] Also Biology/Science and in the case of one institution a single weighted figure for Zoology and Botany.

[2] Includes Classical Languages and in the case of two institutions a single weighted figure for the combined disciplines of Greek and Latin.

[3] Includes one college which has combined Education, Physical Education and Psychology.

[4] Includes one college which has combined English, Human Communication, and Foreign Language.

[5] Includes one institution which has combined humanities and social sciences.

STUDY OF INDEPENDENT HIGHER EDUCATION IN INDIANA
Cost of Instruction Sub-Study
D. FULL COST PER UNDERGRADUATE CREDIT HOUR BY DISCIPLINE

[6] Includes Integrated Studies, General-Liberal Education, and Collegiate College Studies.

[7] Includes "Modern Languages", "Romance Languages" and four institutions with a single weighted figure for the combined disciplines of French and Spanish.

[8] Includes two institutions with disciplines entitled "Math and Physics" and "Math and Science".

[9] The recorded cost at one institution has been deleted from this analysis since noncredit courses caused the cost to be unrealistically high. Inclusion of this figure as the "high" would have distorted rather than illuminated the true range of costs.

[10] Includes joint disciplines of Sociology/Anthropology and Social Work/Social Services in addition to three institutions with a single weighted figure for two aggregated disciplines in this area.

[11] Includes disciplines listed individually as Speech, Theatre Arts, and/or Drama in addition to two institutions showing a single weighted figure for the aggregated disciplines of Speech and Drama.

[12] Includes the disciplines of Philosophy/Religion and Bible.

STUDY OF INDEPENDENT HIGHER EDUCATION IN INDIANA
Cost of Instruction Sub-Study
E. FULL COST PER STUDENT MAJOR BY PROGRAM

	Low	1st Quartile	Median	3rd Quartile	High
Accounting (8)*	$1197	$	$1351	$	$1914
Art (17)	1290	1487	2115	2245	3311
Biology[1] (20)	1428	1684	2002	2270	3710
Business/Business Administration[2] (13)	1135	1250	1467	1849	2000
Business Education (5)	1256		1423		1663
Chemistry (21)	1015	2011	2462	2920	4688
Economics (16)	1352	1569	1857	2196	3897
Education (9)	1459		2096		3575
Elementary Education (10)	1361		1677		2129
Engineering, Electrical (5)	1611		2345		2686
Engineering, Mechanical (5)	1764		2406		3494
English (20)	1374	1703	2023	2231	3691
French (10)	1564		2216		3800
Geology/ Geography (5)	1665		2705		3152
German (7)	1624		2438		3888
History (20)	1379	1600	1965	2159	3611
Home Economics (6)	1419		2246		2478
Interdisciplinary(6)	1163		2170		3053

STUDY OF INDEPENDENT HIGHER EDUCATION IN INDIANA
Cost of Instruction Sub-Study
E. FULL COST PER STUDENT MAJOR BY PROGRAM

	Low	1st Quartile	Median	3rd Quartile	High
Languages (6)	$1881	$	$2443	$	$5602
Mathematics (21)	1355	1779	2081	2427	3919
Medical Technology (6)	1341		1972		2137
Music (19)	1824	2417	2789	3964	5412
Nursing (8)	1049		2164		3705
Philosophy (11)	1638	1780	2172	2840	3388
Physical Education[3] (15)	1316	1348	1662	2063	3424
Physics (15)	1868	2222	3108	3776	6445
Political Science (13)	1436	1533	1838	2251	3213
Psychology (20)	1234	1404	1735	2046	3316
Sociology (16)	1092	1378	1659	2105	2949
Spanish (7)	1621		2211		3099
Speech/Theatre Arts[4] (15)	1636	1980	2267	2739	4790
Theology/Religious Studies[5] (18)	1026	1437	1905	2283	3529
Undeclared (21)	584	1427	1707	2203	3678

* The figure in parentheses indicates the number of institutions represented.

STUDY OF INDEPENDENT HIGHER EDUCATION IN INDIANA
Cost of Instruction Sub-Study
E. FULL COST PER STUDENT MAJOR BY PROGRAM

[1] Includes one institution with one figure for a weighted total of Biology, Zoology and Botany and another institution with one figure for a weighted total of just Zoology and Botany and Bacteriology.

[2] Includes one institution recording freshman and sophomore years only.

[3] Includes one institution with a single weighted total for combined men's and women's physical education. The recorded cost at one institution has been deleted from this analysis since noncredit courses caused the cost to be unrealistically high. Inclusion would have distorted rather than illuminated the true range of costs.

[4] Includes programs listed separately as Speech or Drama or Theatre in addition to two institutions showing one figure for the weighted total of two of these programs.

[5] Includes programs entitled Bible or Philosophy/Religion in addition to two institutions showing one figure for the weighted total of two of these programs.

APPENDIX

GLOSSARY OF TERMS

ACTIVITY CENTER-COST CENTER: A defined activity (such as instruction in a given discipline) to which a variety of specifically identifiable costs are attached.

DIRECT COST: The categories of institutional items of expenditure that are assigned directly to activity centers, e.g., the various academic disciplines. Three categories of items were treated as direct costs within the disciplinary activity centers: compensation (total salaries, wages, and fringe benefits paid to employees over the academic year), supplies and services, and equipment.

DISCIPLINE: A branch of knowledge or teaching. In the context of this study, a discipline is an activity center that provides instructional services to students. In some cases "discipline" may be synonymous with "department." In other cases several disciplines may be combined to form a department, e.g., French, German, and Italian in a Department of Languages.

FULL COSTS: The sum of direct costs and allocated support costs.

INDUCED COURSE LOAD MATRIX (ICLM): A display of the number of credit or contact hours in each discipline or department taken by the average student enrolled in each of the degree programs or majors of an institution.

PROGRAM: A course of study or field of interest taken by a student; a major. Programs are not synonymous, in number or substance, with disciplines or departments since a student major consists of courses taken in a variety of disciplines.

PROGRAM CLASSIFICATION STRUCTURE (PCS): A framework or set of categories developed by NCHEMS for arraying a broad range of institutional data. PCS was developed to enable comparison of data from similar institutions by providing a foundation for achieving comparability in the exchange of institutional data. Instruction, organized research, and public service are classified as primary programs. Student service, academic support, institutional support, and independent operations are classified as support programs.

RESOURCE REQUIREMENTS PREDICTION MODEL (RRPM): An instructional cost simulation model developed by NCHEMS. The primary purpose of RRPM is to generate information necessary for the preparation of instructional program budgets. In its preparation of summary reports featuring discipline and program costs the model requires: institutional definitions, Induced Course Load Matrix (ICLM), calculation of FTE instructional faculty

and salaries, calculation of discipline costs other than faculty salaries and calculation of costs other than general academic instruction.

STUDENT CREDIT HOUR: A measure of progress toward some academic objective by a student. For the purposes of this report credit hours were calculated on a semester hour basis. An undergraduate FTE student was defined as 30 semester credit hours generated throughout the two semesters of the academic year.

SUPPORT COSTS: The categories of institutional items of expenditure whose outcomes are deemed necessary or vital for the successful operation of other activity centers but do not contribute directly to the primary missions of the institutions. Costs classified as "support cost centers" include libraries and audio visual services, executive management, physical plan operations, etc.